WORKING PAPER

Working Paper No.106

TECHNICAL EDUCATION AND INDUST
DEVELOPMENT IN THE MADRAS PRES

by
[illegible].Padmini Swaminathan

MADRAS INSTITUTE OF DEVELOPMENT STUDIES
79, SECOND MAIN ROAD, GANDHI NAGAR, ADYAR
MADRAS 600 020

Working Paper No.106

TECHNICAL EDUCATION AND INDUSTRIAL DEVELOPMENT IN THE MADRAS PRESIDENCY

by
[illegible].Padmini Swaminathan

MADRAS INSTITUTE OF DEVELOPMENT STUDIES
79, Second Main Road, Gandhi Nagar,
Adyar, Madras 600 020

March 1992

ACKNOWLEDGEMENTS

This paper is part of an ICSSR sponsored study on the growth of the Corporate Sector in the Madras Presidency.

I am extremely grateful to:

The commissioner and staff of the Tamil Nadu Archives from where the substantive material for the paper has been drawn;

The staff at the National Archives of India, Delhi;

My colleagues Drs.C.T.Kurien, S.Neelakantan, M.S.S.Pandian and Nasir Tyabji for their comments and suggestions on an earlier draft of this paper;

Ms.T.Maheswari for painstakingly word processing several drafts of the paper;

Mr.V.Mohan for cyclostyling the paper.

Needless to add I alone bear responsibility for the views expressed in the paper.

Technical Education and Industrial Development in the Madras Presidency

(The Illusions of a Policy in the Making)

"It is said that we ought to secure the cooperation of the native public, and that we can do this only by teaching Sanscrit and Arabic. I can by no means admit, that, when a nation of high intellectual attainments undertakes to superintend the education of a nation comparatively ignorant, the learners are absolutely to prescribe the course which is to be taken by the teachers."

(Minute by T.B.Macaulay, dated 2nd February 1835).[1]

"The Natives must either be kept down by a sense of our power, or they must willingly submit from a conviction that we are more wise, more just, more humane and more anxious to improve their condition than any other rulers they could possibly have".

(Minute by J.Farish, dated 28 August 1838).[2]

An official documentation of the need to provide technical education to the people of India can be traced to the Educational Despatch of 1854:-

"Our attention should now be directed to a consideration, if possible, still more important, and one which has been hitherto, we are bound to admit, too much neglected, namely, how useful and practical knowledge, suited to every station in life, may be best conveyed to the

---

All G[overnment] O[rders] refer to those issued by the Madras Government and maintained at the Tamil Nadu Archives, unless otherwise specified.

1. T.B.Macaulay's Minute reproduced in H.Sharp (Ed.) Selections from Educational Records, Part I 1781-1839 (Calcutta 1920), p112.

2. Quoted in the 'Introduction' in Gauri Viswanathan Masks of Conquest: Literary Study and British Rule in India, Faber and Faber (London 1990)

great mass of the people, who are utterly incapable of obtaining any education worthy of the name by their own unaided efforts, and we desire to see the measures of Government more especially directed for the future, to this object, for the attainment of which we are ready to sanction a considerable increase of expenditure."[3]

The underlying objective, however, was to extend European knowledge throughout all classes of the people. ["The systems of science and philosophy which form the learning of the East abound with grave errors, and eastern literature is at best very deficient as regards all modern discovery and improvements"][4]. This objective was to be effected by means of the English language in the higher branches of institution and by that of the vernacular languages of India to the great mass of the people.

The Despatch noted the `high attainments in English literature and European science' by `some of the natives of India' but lamented that this success had been confined to a small number of persons. The need was therefore expressed of extending far more widely the means of acquiring general European knowledge of a less high order but of such a character as may be practically useful to the people of India in their different spheres of life.

---

3. J.A.Richey (Ed.) <u>Selections from Educational Records</u>, Part II 1840-1859, (Calcutta 1922) p.376.
4. Ibid. p366.

The Despatch, then, without abandoning the Filteration Theory of the Mills and of Macaulay[5], modified the same by emphasizing that, while the English language would continue to be made use of as `by far the most perfect <u>medium</u>' for the education of those persons who had acquired a sufficient knowledge of it to receive general instruction through it, the vernacular languages would be employed for the far larger, classes who were ignorant of, or imperfectly acquainted with English. The Despatch hoped that the vernacular literatures of India would be gradually enriched

---

5. The origin, enunciation and refinement of what finally came to be known as the Filteration Theory has a long history and in the Madras Presidency, in particular, it came as a reaction to Munro's scheme of state supported educational system to cover as many sections of the population as possible. Munro's death put paid to this scheme; the court of Directors in London made clear, in no uncertain terms, their social bias by arguing that by raising the standard of instruction among the higher classes a much greater and more beneficial change could be produced than by acting directly on the more numerous class. Macaulay and the Mills [James and John Stuart] refined this argument into a theory but cloaked its justification in terms of practical difficulties, namely, the enormous costs involved in teaching English and in English to the vast numbers involved. Within this there was a difference between the views of J.S.Mill and Macaulay; while Mill considered both European literature and science necessary for the education of Indian children, Macaulay favoured literature. It was Macaulay's view which prevailed. Emphasis on literary study set the stage for what Krishna Kumar calls the "text book culture" which culture reinforced the dominance of literary study and skills in the curriculum. For details refer: (a) Robert Eric Frykenberg "Modern Education in South India, 1784-1854: Its Roots and its Role as a Vehicle of Integration under Company Raj," <u>American Historical Review</u>, Volume 91, No.1 February 1986. (b) Gauri Viswanathan: <u>Masks of Conquest: Literary Study and British Rule in India</u>, Faber & Faber, London 1990, especially pp149-153.
(c) Krishna Kumar "Origins of India's `Textbook Culture'" <u>Occasional Papers on History and Society</u> Nehru Memorial Museum and Library, New Delhi, No.XLVII.

by translations of European books or by "the original compositions of men whose minds have been imbued with the spirit of European advancement, so that European knowledge may gradually be placed in this manner within the reach of all classes of the people".[6]

Following the Despatch came the Report of the Education Commission in 1883. Unfortunately, technical instruction was one of the few matters connected with education on which the Commission was not required to report.[7] But they could not ignore the question altogether and among other things observed that:-

"It has been felt in all provinces, and urged by many witnesses that the attention of students is too exclusively directed to University studies, and that no opportunity is offered for the development of what corresponds to the "modern side" of schools in Europe. It is believed that there is a real need in India for some corresponding course which shall fit boys for industrial or commercial pursuits, at the age when they commonly matriculate, more directly than is effected by the present system."[8]

The Commission recommended a bifurcation of studies into two divisions in the upper classes of high schools - one leading to the entrance examination of the Universities

---

6. Ibid., p368
7. We have not been successful so far in locating material explaining why 'technical education' did not come under the scope of enquiry of this Education Commission.
8. K.D.Bhargava (Ed.) Selections from Educational Records of the Government of India Volume IV, Technical Education in India 1886-1907. National Archives of India, Delhi 1968, p13.

and the other, of a more practical character, intended to fit youths for commercial or non-literary pursuits. The Government of India in its review of the Commission's Report, gave the recommendation the fullest significance by passing the following Resolution in 1884:-

"The bifurcation of studies suggested by the Committee is of special importance at the present time. Every variety of study should be encouraged which may serve to direct the attention of native youth to industrial and commercial pursuits."[9]

In July 1886, Macdonnell, the Home Secretary drew a note examining the condition of technical education in the various provinces and the steps taken by each Local Government to give effect to the 1884 orders of the Government of India enforcing the necessity of improvements in the matter of practical and industrial training. Macdonnell noted that nowhere, except in Madras, had any practical steps been actually taken in giving effect to the orders in question.[10]

The attempt in this paper is to bring out the educational manifestations of colonialism through a study of the development of technical education in the Madras Presidency. The model, method, curriculum/content, and the organization for developing a system of technical education that was initiated in the Madras Presidency around 1885 was

9. Ibid, p15
10...Macdonnell's <u>Note on Technical Education in India</u> reproduced in K.D.Bhargava (Ed.) op.cit, p9-84.

largely based on the experience of England. Simultaneously, efforts were underway in the Madras Presidency to stimulate some form of industrial activity in the state - this largely through the pioneering efforts of Alfred Chatterton who took over as Superintendent of the School of Arts in Madras in 1897. Beginning with a small grant from Government in early 1898 for experiments in the manufacture of aluminium vessels in the School of Arts, so much progress had been made by 1899 that the Government applied to the Secretary of State for permission to employ Chatterton for a term of three years in furthering the progress of technical and industrial education in the Presidency. It was further proposed that he should devote himself to the restoration, organization and development of these technical trades and industries, especially metal works and connected arts which appeared most likely to prove successful.[11]

The closing decades of the 19th century and the first decade of the 20th century saw intense activity in the Madras Presidency in the form of debates/discussions / memoranda/ conferences/resolutions covering the following issues:-

(a) the need to bring the scheme of technical education into relation with the industrial needs and conditions of the country;[12]

11. 'Memorandum on the Department of Industries in the Madras Presidency' in Home (Education) G.O.No.141, Miscellaneous, dated February 7, 1917.

12. Given the circumstances of the period, at one level it was futile to talk of relating technical education to the industrial needs and conditions of the country. And yet, in

(b) the insulation of the artizan classes from any form of formal instruction in schools that could be classified as industrial or technical schools and therefore the inability of the system to tackle"the real problem of industrial education",

(c) the extreme illiteracy of the vast majority of the population which meant that fundamental or necessarily preliminary instruction had to be imparted before going on to specialised technical instructions;

(d) the need for Government intervention in fostering industrial development and embarking on a series of industrial experiments worked on a comparatively large and commercial scale to make industrial and technical education really take off.

For convenience of analysis the paper is divided into three sections. <u>Section</u> I gives a brief outline of the chronological developments in policy aimed at fostering technical education from an all-India perspective. <u>Section</u> II forms the nub of our analysis. Here we document the evolution of the policy relating to technical education in the Madras Presidency, which, while trying to function

---

the Madras Presidency, to some extent, the Department of Industries under Chatterton tried to push through a scheme which

(a) recognised and stressed the need to study those artizan based industries that could be made commercially viable by improvements and,

(b) looked to the state to launch new ventures in order to ameliorate the deteriorating conditions of the vast majority of the poor. In this limited sense there could be said to be some awareness of the need to impart those skills that would help the artizan to hold his own.

within the framework of the Imperial dictat, attempted to evolve a model of its own in the light of what it perceived as being suited to the conditions obtaining in the province. The early phase of enthusiasm (beginning with the closing decades of the 19th century and the opening decade of the 20th century) ended in a near disaster with the Imperial Government ordering the closure of the Industries Department of the Presidency. Thereafter, even the customary lip-service to the magnitude of the problem became few and far between until almost the eve of independence when the Scientific and Technical Man-Power Committee was set up at the All India level. Whatever else this body may have not done, it certainly brought out the depressing scenario as far as the country's technical and scientific manpower was concerned, Madras Presidency included.[13] In <u>Section</u> III we conclude with certain observations borne out of our study of the whole issue.

I

The Report of the Education Commission of 1883 had recommended the introduction of secondary school courses preparing boys for industrial or commercial careers. Upon this subject the Government of India in 1886 circulated a memorandum to all Local Governments in which the position of industrial schools then existing was set forth and it was

13. 'Technical Education:Scientific Manpower Committee' in Education G.O.No.633, dated March 23, 1948.

shown that hitherto little progress of a substantial character had been made in promoting technical education.[14] Since then the subject had received much attention both from the public and the various local governments. One consideration which had forced the question into prominence had to do with the need of industrial occupation for a population rapidly outgrowing the means of support supplied by a too conservative system of agriculture.

It was realized, that, in India, the application of capital to industry had not then developed to the extent which in European countries had rendered the establishment of technical schools on a large scale an essential requisite of success. But the extension of railways, the introduction of mills and factories, the exploration of mineral and other products, and the expansion of external trade was expected to create a demand for skilled labour and for educated foremen, supervisors and managers. The conspicuous insignificance of what had been attempted in India, then, by way of promotion of technical education prompted the Governor-General in Council to suggest that local governments were to take action in two ways:- one, collect information on the extent, character and circumstances of important local industries in every province of India; and (2) each government was to form a committee of educational experts and professional men who would make suggestions from

14. 'Resolution on Industrial Education and Industrial Survey of India' in Home Education B.Proceedings, January 1891, Nos 14-15, National Archives of India, Also reproduced in K.D.Bhargava (Ed.) :op.cit, p 85-88

time to time for the supply of appropriate means of technical education, and at the opportune time establish a technological Institute for the enlargement of the provincial Schools of Art and Design and for the larger cooperation of the University in the promotion of the object in view.[15]

Between 1881 and 1894, the Directors of the provincial departments of Revenue and Agriculture were frequently convened to discuss the various subjects with which they had to deal among which was that of agricultural education. In 1888, at the instance of the Conference held in that year, the Home Department included in its quinquennial Resolution on educational progress a request that the departments of Education and Agriculture might be required to work out in concert a scheme for primary education "which would render the agricultural population capable of assimilating new ideas and of understanding any suggestions made to them."[16]

The suggestions of the provincial conferences that were held in 1896-97 received definite expressions in a comprehensive Resolution issued by the Government of India in 1897 which summarized the defects discovered in many of the provincial schemes of primary education and laid down principles for further observance. The most important reforms which were advocated were:-

---

15. Ibid

16...Quinquennial Resolution on Educational Progress. Quoted in E.Buch's Report on Practical and Technical Education. Reproduced in K.D.Bhargava (Ed.) op.cit, p124.

(i) That object lessons should no longer be merely included in the education curricula as an <u>optional subject</u>, but should be utilized as a <u>compulsory method</u> in the teaching of all subjects;

(ii) that instruction should be given in connection with <u>familiar</u> objects;

(iii)that elementary science should not be an optional subject, but compulsory through the medium of readers;

(iv) that advanced instruction in any special science should not be carried too far;

(v) that in view of the fact that the bulk of the population were interested in land, instructions should in all primary schools be given in drawing, rural and commercial accounts, and in such simple surveying and mensuration as can easily be taught to any boy."[17] (emphasis as in original)

In 1901, the Government of India requested E.Buck to enquire into and submit a report on the position and progress of practical education in each province.[18] The conclusion that Buck drew from his examination of the position throughout India was that the general intention of all the educational departments was in accordance with the principles of the Imperial Resolutions but that the measures taken were not always clearly defined and were in some provinces insufficient. In some of the provinces no definite scheme had yet been drawn up on the basis of the Resolutions of 1895 and 1897, no final considerations had been given to these resolutions, no modifications made in the curricula, progress effected in the teaching of teachers

17. Ibid, p126-127
18. E.Buck : <u>Report on Practical and Technical Education</u> Home Education A Proceedings, December 1901, No.20, National Archives of India, Reproduced in K.D.Bhargava (Ed.) op.cit, p116-195.

was slow while some of the school books even then went against leading principles enunciated.[19]

Buck noted that the Educational Despatch of 1854 on which the educational scheme of the country was founded, had divided the classes for whom a different kind of instruction was needed under three heads - high, middle and low. This division, according to Buck, though sufficient half a century ago for the purposes of initial organization, was not adequate but needed further differentiation and a determination of the line which was to separate the functions of the educational staff from those of the administration of industrial and technical schemes.[20]

Buck provided a chart of the different types of primary and technical schools that he came across in the various provinces, (Reproduced in Table 1) He found that the schools of type VI was the favourite type of industrial school in India where a good deal of literary education was given at the same time that minor trades of which the most prominent were carpentry and smithy work were taught. This type originally founded by missionaries had been more or less copied in most of the industrial schools established by official authority. The sale of the articles made in the school provided for the maintenance of the school. The method of instruction in these schools, according to Buck, was faulty, the boys being taught by a salaried artizan who had no personal interest in the success of the work turned

19. Ibid, p134
20. Ibid, p148

Table 1

__Schedule of the different types of Primary and Technical Schools found to exist in the various Provinces__

Class of School		Provinces in which found	
	PRIMARY		
I	In which no teaching is given by practical methods i.e. kinder garden, object lessons, illustrations etc.	I	North Western Provinces
II	In which object lessons and elementary science are optional subjects.	II	Madras
III	In which practical methods are employed.	III	More or less in every province. More perhaps in Bombay and the Central provinces than elsewhere.
IV	In which hand and eye and manual training are added to III	IV	Central Provinces town school; North Western Provinces English Schools; Bengal vernacular schools
	TECHNICAL		
V	Manual work schools on the "disciplinary" system which prepare boys by manual exercises for manual occupations.	V	All industrial schools in Bombay.
VI	Schools which give literary instruction combined with teaching a trade under school officials	VI	Aided schools, chiefly mission in Bombay, Madras, North Western provinces and central provinces
VII	Special trade schools not giving literary instruction for teaching improvements in an industry or for teaching a new industry under school officials	VII	Sericulture school in Bengal; Aluminium school in Madras, Art Schools in Bengal, Madras, Bombay and Punjab; Rurki college Industrial class.
VIII	Special schools, for training artizans in foundries, workshops etc.	VIII	Lahore
IX	Special Schools for higher class employees	IX	Victoria Jubilee Institute, Bombay
X	Special trade schools for teaching industries under native artizan teachers on the Naples system.	X	To be introduced at Lucknow: recommended for all towns

Source: E.Buck, __Report on Practical and Technical Education__ Home Education A Proceedings, December 1901, No.20, National Archives of India, Reproduced in K.D.Bhargava, op.cit., p151.

out while the literary education was too advanced for those who were meant to follow a manual occupation. Buck found that the largest number of such schools existed in the Madras Presidency, where the number of missionaries were more than in any other province. Chatterton in a note, condemned the type as having a double object in view and failing in both.[21]

Buck strongly condemned Government opening industrial schools of the number VI type for the following reasons:-

(a) The boys for whom such education was provided by missionaries were as a rule either orphans or christians with no family connections who could train them in any industrial calling. The Government's objective, on the other hand, was to give a training to the children of artizans.

(b) The undertaking of commercial transactions by government officials was seriously objected to since it would imply purely government institutions competing with local artizans.

(c) Boys trained in such schools unless they were under the management of exceptionally able missionaries seldom adopted the trade taught. The express object of Government was to ensure that the boys of an industrial school followed the trade taught.[22]

21...Chatterton wrote in his note: "Schools under Class VI have a double object in view, and as a rule they fail to achieve success in either branch of the work. I therefore think that the establishment of such schools should not be encouraged. This, I think, also is the opinion of the European managers of many of the Mission Schools, though some advocate, for their own requirements, the establishment of schools of the type described in class V, in which the boys get a preliminary knowledge of handicraft, and then when they have attained a certain degree of manual skill and completed their course of general education, they are drafted into a special trade school (class VII). This, I think, has been the idea from the very outset and schools of class VI have arisen through the inability on the part of the managers to clearly recognise the necessity for keeping schools of class V and class VII perfectly distinct." (emphasis as in original) Ibid., p153.

22...Ibid, p154

The compulsions of the government apart, the arguments put forward by Buck highlight various aspects of the complexities of the situation. At one level, to derive maximum benefit from the instruction imparted in industrial schools, the government felt that instruction was to be differentiated for different classes. At another level, caste domination of particular trades made it difficult for those outside the castes to learn a trade. It was here that the missionaries played a significant role by providing an avenue to the native Christian community to learn trades which otherwise would have been out of bounds to them. On principle, the government expressed its abhorrence over entering into commercial transactions (which would have been the only way to make a dent in occupations dominated by caste), and, wanted that, in industrial schools the trades selected were capable of improvement by expert instruction or the introduction of scientific methods.

Summing up the main defects of the then existing industrial schools Buck enumerated the following, namely: that general and technical education were combined, that instruction was not differentiated for different classes, that disproportionate attention was given to carpentry and smithy work, that aims and objects were not defined, or, if they were, not kept in view; that if a trade was taught it was not followed, that attempts at working for a market lead

to embarrassment, and that, the leading defect of all was that no clear principles were laid down.[23]

"The prevalent idea of a technical school", wrote Chatterton, "seems to be that it should provide elementary instruction in drawing, carpentry, blacksmith work, and sometimes in weaving and rattan work as well. Whether there is any special need for these trades in the locality where it is proposed to start the school or not, does not seem to be considered a matter of any importance. And the invariable methods employed to obtain pupils is the offer of scholarships of sufficient value to enable the boys to provide for themselves during the time they are in the school. The great bulk of the money spent upon such scholarships is wasted, for as soon as the scholarship ceases, the boy returns to his native village and takes no further interest in the trade in which he has been taught."[24]

An important observation made by Buck relevant from the Indian point of view (considering that England's experience formed the model for the setting up of technical schools in India) was that England could no longer claim the monopoly she once possessed of modern manufactures. Austria and Germany had embarked on a serious training programme of their subjects in scientific, technical and artistic training. "In England people are still content to repeat

23...Ibid, p160
24...Ibid, p162 éChatterton's note reproduced as footnote (2)è

that trades cannot be taught in a school. The Austrians and Germans have discovered that trades cannot be efficiently taught without a school. In many towns employers are required to send their apprentices to a technical school for a certain number of days a week, and a breach of the law is followed by fine or imprisonment. Nor are the schools confined to a few large towns. In Austria, in particular, a great point is made of carrying technical training to the small towns and even to the villages".[25] (emphasis as in original)

A Conference on Technical Education was held at Simla in 1901. Before going into the resolutions passed at the Conference, a point to be noted about this Conference is that, its proceedings were kept secret, and, more important, no Indian was invited to it, even though, as Aparna Basu has pointed out, representatives of the Indian educated class had been found competent to advise the Government on the framing of the educational policy in 1882.[26]

Addressing the local governments with special reference to the resolutions passed at the Simla conference in regard to technical education, J.P.Hewett, Secretary to the Government of India, stated, among other things that (a) the conclusions of the Conference were entirely acceptable to the Government of India; (b) the Governor-General in Council attached great value to the dissociation of technical

25...Ibid, p194-195
26...Basu, Aparna : The growth of Education and Political Development in India, 1898-1920 Oxford University Press, 1974, p19-20

education from ordinary literary education; (c) the technical or industrial school was to be strictly limited to scientific and technical courses; and (d) every endeavour was to be made to secure that students before entering industrial schools had been properly grounded in the simple forms of education on the subject.[27]

The conference recommended the institution of a number of State Technical Scholarships for the encouragement of the further studies of Indian students in the higher branches of technical education. The proposal was accepted by the Government of India who were prepared to institute ten scholarships a year, two each to the Presidencies of Bombay, Bengal and Madras and the remaining four to be distributed among other local governments and administrations in whose territories technical instruction had not advanced sufficiently.[28]

The Simla Conference had come down heavily on the lack of organization and the want of purpose of the then existing industrial schools in the country.[29] The Government of India therefore decided in 1901 t. appoint a Committee to visit the different provinces in connection with the

27...Letter to Local governments regarding encouragement of technical education from J.P.Hewett, Secretary to the government of India, dated November 20, 1901. Home Education A Proceedings, November, 1901 No.57, National Archives of India. Reproduced in K.D.Bhargava (Ed.):op.cit, p196-201.

28. Ibid

29... 'Resolution of the Simla Conference (1901) on Technical Education'. Reproduced in Papers Relating to Technical Education in India, 1886-1904, Calcutta, 1906 p251-253.

institution of industrial schools to examine what had already been done and with what measure of success, and to confer with local educational officers and others as to the best means of establishing such schools.[30]

The scheme sketched by the Committee had for its end the abolition of the industrial schools and the substitution for them of a system of supervision of workshops. The proposals of the Committee appeared to the Government of India to be open to certain serious objections:'

(i) The principles accepted by the Government of India in respect of technical education was that all such education was to be based on some preliminary education of a simple but practical nature, that this preliminary education was to form part of ordinary primary education than in the curriculum of industrial schools, and that the instruction given in industrial schools was to be technical rather than general. But in the school recommended by the Committee there was no such separation of instruction; both general and technical instruction was to be given in the same institution and under the same supervision.

(ii) In the Committee's report, all teaching other than actual workshop practice was relegated to a subordinate place, and was to be given voluntarily in night schools. From previous experience, however, the Governor-General in Council had little expectation that youths who spent their entire working day in workshops would voluntarily attend a night school with any regularity and he had no doubt whatever that systematic instruction in principles was essential to the success of any system in industrial training.

(iii)The Committee laid emphasis on the marketable value of the work to be done by the pupils in industrial schools. In the judgement of the Government of India, however, this position was based upon a failure to distinguish sufficiently between a school and a commercial undertaking. The Government of India made it clear that industrial schools were to be primarily educational and not commercial

---

30...`Resolution of the Government of India on the report of the Committee on Industrial Schools in India' Papers Relating to Technical Education in India, 1886-1904, (Calcutta 1906), p257-261.

enterprises. The Committee, on the other hand, maintained that such institutions were to aim at financial profit.[31]

Thus as matters stood there were two entirely different sets of principles and nothing was done to bring either of them to the test of practice. In commending the question to the attention of local governments, Risley, officiating Secretary to the Government of India in the Home Department, pointed out that for practical purposes it was most necessary to distinguish between the kind of institutions which would be suitable in great industrial centres such as Bombay, Howrah or Cawnpore, where capital was employed in the organization of industries on a large scale and those suitable for towns in which the local industries were practised as handicrafts in small private establishments. The need to enlist the cooperation of the employers of labour was emphasized since it was felt that, if employers attached importance to training which such institutions offered, employees would be far more ready to believe in its value.[32]

The Government of India wanted the Local Governments to examine the lines on which a practical beginning could be made. To the Government of India it appeared that the two important objects:-

---

31. Ibid, p259

32...Letter from H.H.Risley. Officiating Secretary to the Government of India, Home Department (Education) to the Secretary to the Government of Madras (Educational Department) dated September 30, 1903.
- Educational G.O.No.313, Press, dated May 12, 1905.

(1) of keeping up and developing a boy's inherited manual skill, and

(2) of giving him a general education which would enlarge his prospects as a craftsman while preventing him from falling into the clerical groove,

could be attained by starting in selected places half-time industrial primary and higher primary schools in which the course of studies would be designed with special reference to teaching that accuracy of workmanship in which Indian artisans were conspicuously deficient, and to familiarising the pupils with the best designs and processes as applied to their hereditary trade. The boys were to spend half the day at the primary school and the other half in working as registered and supervised apprentices under approved atrisans who would receive a monetary reward for each apprentice on the following conditions, namely,

(i) that they taught them the trade thoroughly and not merely the elementary processes; and

(ii) that they accepted supervision and control by a government expert.[33]

The acceptance of the above scheme was to be enforced with certain conditions. In the first place admission was to be strictly limited to pupils whose caste occupation was the industry which the school had intended to develop. Secondly, the education given in the primary school was to be so ordered as not to fit the pupil for clerical

33...Ibid

employment. No english was to be taught, reading being limited to the vernacular. Thirdly, scholarships for all the pupils was to be provided, at any rate for some time to come. This scheme, applicable both to the larger industrial enterprises and to smaller handicrafts, was, in the main to depend upon government and not upon private management. In the opinion of the Governor-General-in-Council, it was essential that the trade and the subjects of instruction be properly selected and this could not be left to the chance of private enterprise in the same way as the establishment of ordinary schools where the curriculum was of a defined type.

Risley concluded his letter by stating that the solution of the problem rested mainly with the local governments who were to approach the matter with reference to the general considerations presented in the letter.[34]

34...Ibid
See also in this context Aparna Basu, "Technical Education in India, 1900-1920", Indian Economic and Social History Review, Volume IV, No.4, December 1967. The author, among other things, points out that Lord Curzon, who had assumed the Viceroyalty in 1898 made it clear that money and effort was to be expended on technical and industrial schools and not on higher technical education. She cites the case of Jamsetji Tata who in 1896 approached the Viceroy with a scheme aimed at establishing a Research Institution utilising the income derived from his property. The Viceroy was not in favour and conveyed his misgivings to the Secretary of State for India. The latter agreed with the Viceroy that "the keenness of natives for technical education" arose from the belief that whereas the purely literary degree which they now obtained failed to give them education, technical education would offer them alternative occupation.'(p362-363)

Despite the "torrents of words"[35] both the government of India and the local governments were in a maze as to the course to be followed. Their exasperation was all the more acute given the realization that ordinary education which formed the preliminary to technical instruction was so little advanced among the pop lation at large and more especially among the classes and castes who were likely to adopt an industrial life. The cause for the slow progress was blamed on the character of the people themselves. "They do not trust one another and they are unable to adopt cooperative methods. Of all those who have received in the high schools and the University a scientific training upon which they would readily found a technical education, the numbers who have so applied that training during the last quarter of a century would be counted upon the fingers of one's hand. We give ample facilities but no advantage is

---

35...G.S.Forbes, an official in the service of the Madras Government, was quite critical of the statement made at the Ootacamund Conference of 1908 to the effect that technical education was a matter of interest to a very large section of the public in the Presidency and that there was a 'popular demand' for the same. He noted: "Out of 40 millions of population there are not 300 who care a brass farthing one way or the other. We have had torrents of words, but almost entirely from those classes of the people, who will do nothing themselves in the direction suggested but talk and whose sons with an education which would fit them to take up scientific or technical instruction steadily decline to embark on scientific or industrial enterprises. Most of those I refer to are actuated largely by political motives: if they really cared as much as they profess for industrial reform they would do something themselves instead of urging the government to act for them."
-Notes to Revenue G.O.No.2894, Press, dated October 17, 1908

taken of them. Even our comparatively few technical scholarships go a begging!"[36]

H.W.Orange, Director-General of Education in India, in his letter to the Secretary to the Government of India, Home Department, in 1908,[37] listed out the problems, that he felt, plagued the administration of the Indian educational system, namely, that

(i) it was cumbersome and slow;

(ii) the division of functions between the Director of Public Instruction and the Secretary tended to obscure vigour and consistency and weaken discipline;

(iii)the system then existing prevented the establishment of properly organized educational departments able to expand with the rapidly increasing needs of educational business based on a proper system of devolution of authority and able to distribute departmental business amongst different officers on well considered principles.

In the debate on the Indian Budget in the House of Commons in July 1908 Lord Percy was reported to have stated that, so far as he knew, no progress had been made with any of the measures agreed upon at the Simla Conference in September 1901 except the reform of the Universities. While Orange felt that such a statement was too drastic considering the records of progress contained in the reports

36...G.S.Forbes' observations. Ibid

37...Letter from H.W.Orange, Director-General of Education in India to the Secretary to the Government of India, Home Department, dated, Simla, October 21, 1908. - Educational G.O.No.572, Press (Confidential), dated October 22, 1909.

of the Directors of Public Instruction, nevertheless, he thought that after all allowances had been made for time necessarily spent in preparation and discussions, some ground for just criticism was afforded by the slow pace at which progress had proceeded. When the following facts were put together, namely, - that the Educational Conference that met in Simla in 1901 was unanimous as to the lines upon which improvement, reform and expansion was to proceed, that, that Conference was itself the outcome of discussions which had been going on for two years, that since the Conference no local government had felt the necessity of reconsidering its adherence to the main principles there laid down, and that in the years following the Conference the financial conditions of the country were favourable - there was considerable legitimacy in the objection to accounts that summed up the progress thus far made with such remarks that "measures are still under consideration" or that "changes have been sanctioned and are shortly to be put into effect".[38]

The increasing realization of the importance of technical education led in some quarters to the demand for the creation of a separate department, despite the fact that the creation of a department of technical education separate from the educational department had failed so conspicuously in England.[39] Some of those who advocated such a separation

38...Ibid

39.. The administration of technical education in England was controlled for many years by the Science and Art Department, which was in the first instance an offshoot of

were led to this view by the consideration of the inability of the education departments, as then organized, to add to their burdens by undertaking the supervision of a new branch of work. The Acting Secretary to the Government of Madras in his reply to the Secretary to the Government of India stated that Orange's attack of the education department was in fact an attack on the whole machinery of Government in India. He pointed out that in this division of functions the education department was in no way peculiar;" no department of Government is exempt from the criticism and control of secretariats" and no head of a department "is left to administer it in his own way with such discretion and ability as he can display subject only to directions on broad matters of policy." It was felt that "in this country, it is, in the opinion of His Excellency in Council of more importance that the decisions of Government should be correct than that they should be speedy."[40]

---

the Board of Trade. It was then an independent department by itself and was afterwards a department nominally united with the Education Department by virtue of a common minister but really almost separate and independent. After an experience of forty six years in England of such independence the Education Department and the Science and Art Department were brought together in 1899 and were really fused into one department under a single permanent Secretary. "So great were the evils of the separation of the administration of technical education from that of general education, and so signal has been the success of uniting them, that there is not a single person in England having any acquaintance with the subject who would propose to revert to the status quo ante 1899 or who would not concur as to the advantages gained by the measure of consolidation then carried through."
- Letter from H.W.Orange, Ibid

40. Letter from W.Francis, Acting Secretary to the Government of Madras, Educational Department, to the

In September 1912, the Government of India felt that the time had come to endeavour to connect educational institutions more closely with business firms, railways and other employers of labour, to enquire how the former could better meet the requirements of the latter and to pinpoint the way to further employment of Indians in them. Col.Atkinson and Mr.Dawson were selected; they conducted the enquiry in the leading industrial centres of India. The Government of India was keen on eliciting the opinions of the local governments on the recommendations made in the report.[41]

Tressler, Superintendent of Industrial Education in the Madras Presidency in his note on the report, pointed out that the investigations made by Col.Atkinson and Dawson really resolved itself into an enquiry as to the nature of the combination needed to produce the class of workers required in modern industry. "The tendency in India at the present time is to move in extremes, and the only classes now represented to any extent are the bazaar workmen on the one hand - representing art untempered by science and the graduate on the other - representing unadulterated bookscience."[42]

Secretary to the Government of India. Home (Education) dated Ootacamund, October 22, 1909.

41. Letter from H.Sharp, Joint Secretary to the Government of India, Dept.of Education, to the Secretary to the Government of Madras, Educational Dept., dated Simla, September 27, 1912.
 - Educatinal G.O.No.798, Press, August 26, 1913.

42...A General Note by K.T.B.Tressler, Supdt. of Industrial Education in Educational G.O.No.798, Press, August 26, 1913.

For purposes of classification according to Tressler, the workers in an industry (on the technical side) could be divided into three groups: the workmen, the foremen and the technical assistant. In the last group a very high standard of attainment was called for; in the next the scientific standard was lower but a good deal of practical experience was also demanded; in the first group a very high standard of practical skill was required.

According to Tressler the problem to be solved was this:- to infuse a sufficient degree of science or art into the training then provided to the classes, to leaven the same and turn it into a thing of industrial value, and further to develop the intermediate group that was then almost non-existent. In considering the question, certain fundamental problems had to be borne in mind: first and foremost was the need to recognise that although the science of a trade could be imparted by teaching, the art could only be acquired by practice; further, as a fact proved by general experience the only way of improving the art of trade was to improve the conditions under which it was practised, that is, to improve the workshop organization. In technical education, therefore, two separate educational factors had to be considered: the school and the workshop, the functions and scope of each being entirely distinct.

Tressler felt that under existing conditions it was only in the matter of school training that the educational department could influence industrial education. Such

training however excellent it might be intrinsically, could not be expected by itself to lead to a complete solution of the problem under consideration. School training could teach a pupil the principles of his trade but the real solution of the problem according to Tressler lay with the employer of labour over whom the Government had no control.[43]

In 1915 a confidential note submitted to the Secretary of State drew attention to the growing discontent among the population, which followed two particular lines of expression.[44] In the first place, there was the constant asservation that the British government had with malice intent or, if not with malice, by their attitude of indifference allowed indigenous industries to be overwhelmed by foreign and especially by British competition. The second charge was that the British system of education had confined the energies of the educated young men to literary pursuits and the learned professions and had created among them a demand for employment limited to government service, the law and medicine. These contentions emphasized one aspect of the need for an industrial policy which would enable technical education in India to produce its best results and which would lighten the pressure on purely literary courses and reduce the excessive demand for

---

43...Ibid

44...Note addressed to Austen Chamberlain, His Majesty's Secretary of State for India, dated Delhi, November 26, 1915.
- Educational G.O.No.46, Miscellaneous, (Confidential), dated January 12, 1916.

employment in the services and callings to which the courses lead upto.

Though the subject of technical education was perhaps one line in which an approach towards a policy had been attempted it had, however, not made any marked effect on the development of Indian industries. The various forms of technical education whether of the nature of workshops, industrial schools, technical colleges or institutes, had, in some cases produced artisans; in the case of Bombay, where Indian industrial development had already made considerable progress, there had evolved men who after a few years' work in existing factories, had become successful engineers, weaving and spinning masters and even factory managers; but even in Bombay there was no instance in which they had created or appreciably extended an industry. It was at one time undoubtedly expected that they would bring this about apparently on the mistaken analogy of Japan, where, however, the first step taken towards state industrial aid was by starting demonstration factories under European control.[45]

In a resolution dated 19th May 1916,[46] the Government made explicit its decision to take up for examination the question of the expansion and development of Indian manufactures and industries in a more comprehensive manner than had hitherto been attempted. In framing the terms of reference of the Commission, the Government excluded two

45...Ibid
46...Educational G.O.No.622, June 5, 1916.

matters from the scope of enquiry of the Commission, namely, (a) any consideration of the then existing fiscal policy of the Government of India, and (b) aspects of technical and industrial education which had been dealt with by committees working in England and India whose reports were then under the consideration of the Government of India. However, in discussing the functions of the Provincial departments of industries, the Commission proposed that the control of technical and industrial education should vest in the department of industries with the government reserving the right of deciding whether particular schools should be controlled by the educational or industries department, such as, the Reformatory schools and the Schools of Art. Another proposal of the Commission was the constitution of an Imperial department of industries; among the latter's function was included the need to advise local governments regarding the conduct of industrial and technical education and this advice was to be tendered through the medium of "thoroughly qualified visiting experts", the suggested implication being that these 'itinerant experts' would replace the Provincial Inspector of industrial schools. This move was opposed among others by the Director of Industries, Madras.[47]

Around this time was also published the Montagu-Chelmsford Report on Constitutional Reforms. Both the

---

47...See letter from C.A.Innes, Director of Industries, Madras to the Secretary to Government, Revenue (Special) Dept., dated January 20, 1919.
- Revenue (Special) G.O.No.791, Press, April 28, 1919.

Reports emphasized the need for rapid industrialisation of the economy with active state participation . However, while the Indian Industrial Commission's (IIC) Report emphasized the need to centre direction in the Government of India, the Reforms Committee emphasized the need to minimize central supervision and direction of provincial activities. A debate was generated across the country which focussed on the following main points:- [48]

(a) the constitution of an imperial department of industries which would act as a nodal organization to coordinate and direct industrial activity in the provinces;

(b) the creation of all-India scientific and technical services.

Innes, Director of Industries, Madras, commenting on the administrative proposals made in the IIC's Report stated that a careful reading of the Report brought out very clearly its centralising tendency, even though the Commission claimed that its scheme was in general accord with the administrative changes proposed in the Reforms Scheme. It was evident that there were two antagonistic forces at work. The commission was concerned solely with India's industrial deficiencies, and deliberately it had set itself the task of devising the most efficient way of remedying those deficiencies. The reforms scheme, on the

---

48. Some idea of the debate can be gathered from the replies received by the Government of India to its letter N.589-D of 7th December 1918 to Local governments inviting the latters' opinions on the Report of the IIC.
- Revenue (Special) G.O.No.2221, Press, December 3, 1919.

other hand, was prepared to sacrifice efficiency to other and wider considerations. Hence the one scheme hinged on centralization and efficiency and the other on decentralization even at the expense of efficiency. Ultimately, Innes felt, the decision depended on the view taken regarding India's industrial position. If the commission was right in holding that India's backwardness in industrial development was so serious as to involve political, economic and even national danger, it was justified in asking local governments to agree, in the interests of efficiency, to a period of centralized control. At the same time, Innes felt, that this stage was to be purely transitional, and as in political reform so in industries the goal should be the largest possible measure of decentralization to local governments at the earliest possible date. Operationally it was felt that the more reasonable course would be for the government of India to confine itself to the encouragement of such industries which were essential from the point of view of national safety or were of more than provincial importance and with these reservations to leave it to local governments to solve their own problems with their own staff in their own way.[49]

The Secretary, United Provinces Chamber of Commerce in his letter stated that while his Committee was in accord with the Industrial Commission on the principle that in

49...Letter from C.A.Innes, Director of Industries, Madras, to the Secretary to Government, Revenue (Special) Dept. dated January 20, 1919.
- Revenue (Special) G.O.No.2221, Press, December 3, 1919.

future government must play an active part in the industrial development of the country, they were strongly opposed to the creation of an Imperial department of industries in which was proposed to be centralised the control and direction of the advocated policy. The letter added further that the idea of a new Imperial department of industries was to be abandoned altogether and industrial development made a concern of the provincial governments for which the local governments in their respective departments of industries were to be wholly responsible and in respect of which they were to enjoy the greatest possible freedom of action and initiative. The Committee was also strongly opposed to the creation of the various Imperial India Services recommended. They fully associated themselves with the view that if importation became necessary only recognised experts and specialists were to be engaged on special terms and short contracts and on the express condition that the training of our young men would form an important part of their work here. Similarly if the establishment of regular industrial and scientific services was found indispensable at any later stage, the provincial governments could organise the same. These services would then be provincial and not imperial services and under the control of the government under which they were to serve.[50]

50...Copy of a letter from the Secretary, United Provinces Chamber of Commerce, Cawnpore, to the Secretary to Government, United Provinces, Industries Department, Allahabad No.6806, dated March 3, 1919.
- Revenue (Special) G.O.No.2221, Press, December 3, 1919.

A resolution moved, in the Legislative Council of the United Provinces of Agra and Oudh also brought out the differences in recommendations on administrative machinery in the two Reports. A majority of the Council was in favour of the subject of the industrial development being entirely provincial and also transferred so that the delays incidental in making frequent references to Simla and Oudh could be avoided, and further that action could be taken in response to, and in sympathy with the demands of public opinion. Resolving against the constitution of imperial services, the Council pointed out that informed opinion was against even the then existing Indian Educational Service. Several educational experts had opined that the wisest policy would be for men to be appointed as occasion arose, specially qualified men on terms arranged for in each case so that no vested interest would grow up and the best available talent could be obtained in every case and from anywhere.[51]

It should be noted here that while witnesses before the Industrial Commission explicitly stated that no one should be imported into India unless he was a recognised expert in his own field, and that young men from abroad who were educated but inexperienced should not be brought to India

---

51...Extract from the Proceedings of the Legislative Council for the United Provinces of Agra and Oudh - dated Allahabad, January 24, 1919.
- Revenue (Special) G.O.No.2221, Press, December 3, 1919.

and allowed to get their practice at the expense of India,[52] the recommendation of the Commission was directly contrary. The IIC wanted that recruits for new Imperial services should be obtained at an early age; these would be men who had received theoretical training in England and other countries; they would come to India to pick up practical knowledge and they would spend several years in doing that. It would not be any part of their duty to bring up Indians themselves to be able to perform those duties. The net result, it was pointed out, would be that in department after department which required any technical knowledge or skill India would continue to be dependent upon imported agency very much to the same extent as before.[53]

Campbell, Acting Secretary to the Government of Madras, in his letter to the Secretary to the Commerce and Industry department of the Government of India wanted that, in deciding the number and location of Imperial research institutions, regard should be had to the essential differences between conditions in Southern India and those that obtained in the North. For example, he pointed out, that a single specialized research institute for the group of subjects relating to oil-seeds would not meet the requirements of India as a whole, and that, if it were

---

52...Opinion submitted by H.P.Gibbs, General Manager, Tata Hydro and Electric Supply Company to the Indian Industrial Commission.
- Quoted in the Extract from the Proceedings of the Legislative Council for the United Provinces of Agra and Oudh ...op.cit.
- Revenue (Special) G.O.No.2221, Press December 3, 1919.
53...Ibid

decided to establish such an institution in northern India, another Imperial institute would have to be established for research in connection with tropical oilseeds in southern India. The fear of regional discrimination is evident from the following observation made by Campbell in justifying his plea to the Imperial government to look into the requirements of different regions: "Moreover, the usefulness of a research Institute to an industry varies inversely with the distance of the Institute from the locality in which the industry is established."[54]

Provincial autonomy was accompanied by financial stringency leading to retrenchment, which was accentuated further in the depression and post-depression years. This slowed down industrial development and technological progress. Nothing significant by way of educational policy/resolutions was announced in the 1930's and 1940's though establishment of stray institutions here and there did take place.[55]

The magnitude of the task facing the country on the eve of independence in terms of the paucity of scientific and technical personnel and the extremely poor base from which post-independent India had to build can be gauged from the following statistics provided by the Scientific and

---

54...Letter No.792, dated Ootacamund, April 28, 1919.
- Revenue (Special) G.O.No.2221, Press, December 3, 1919.
55...For details see, for example, Saugata Mukherji: "Some Aspects of the Policy on Technical and Industrial Education in India under Colonial Rule from Late Nineteenth Century to Independence", Occasional Paper No.123, Centre for Studies in Social Sciences, Calcutta, June 1990.

Technical Man-Power Committee set up by the Government of India in April 1947.[56] The committee could not obtain up-to-date statistics concerning the annual output of scientific and technical personnel from institutions and had to make do with figures concerning the whole of British India for the year 1940:

Students passing the various examinations	
Matriculation or its equivalent	92555
Intermediate Arts	19000
Intermediate Science	5453
B.Sc (Pass)	2499
B.Sc (Honours School)	359
M.Sc	428
Medical Degree	875
Agricultural Degree	293
Engineering (Civil, Mechanical & Electrical, Mining and Metallurgy) degrees	638
Doctorate (Arts, Science, Medicine) Degrees	38

The Committee expressed the opinion that they had no reason to suppose that conditions in 1947 were remarkably different from that obtaining in 1940. Uncertainty as to the extent of development of Indian industries in subsequent

56...What follows, including the statistical details have been summarized from the Committee's Report.
- Educational G.O.No.633, dated March 23, 1948.

years and the inadequacy of information available to them, made it difficult for the Committee to assess with reasonable exactitude the requirements for technical personnel for the following five years. The Committee therefore made an approximate assessment by analysing the new capital flotation allowed by the Government and from this tried to infer India's requirement for technicians. We reproduce a table given by the Committee that showed the position of new capital issues for some of the industries in January 1946 together with a column showing the number of additional technical personnel that would be required for the successful running of these industries. The technical personnel were divided into three categories:-

`A' - Experts

`B' - Technicians with superior qualifications.

`C' - Lower grade technicians including mechanics.

No.	Industries	New Capital Issues allowed in 1946 (Rs.in lakhs)	Estimated requirements (Number in Grades) `A'	`B'	`C'
.	Glass and Ceramics	213	10	30	200
.	Chemicals and Drugs	570	20	100	250
.	Soap and Oil (excluding edible oils and Vanaspathi)	110	8	10	100
.	Rayon and Art silk	402	6	30	200
.	Paper, Board etc.	281	10	50	150
.	Plastics	50	10	40	200
.	Leather	85	5	13	35
.	Cement	463	10	20	80
.	Woollen	137	10	36	100
0.	Rubber	117	70	94	188
1.	Engineering	1242	25	150	1000
2.	Electrical	910	25	150	300
3.	Non-Ferrous Metals	98	6	45	250
4.	Machine tools	122	100	400	1000

The output of graduates in engineering and technology in 1946 was stimated as follows:

No.	Branch	Number
.	Aeronautical Engineering	15
.	Architecture and Building Construction	20
.	Civil and Municipal Engineering	467
.	Chemical Engineering and Chemical Technology	244
.	Electrical Engineering	285
.	Mechanical Engineering	258
.	Metallurgy	27
.	Mining	27
	Total	1343

From a comparative study of the figures of the estimated output with those giving the immediate requirements of industry alone, leaving aside the requirement of governments for their contemplated large-scale public works, the Committee found that they had to plan for at least a four-fold increase in the output of all categories of personnel, if the needs of the next four or five years had to be met. In this context a note was prepared for the Committee giving a statement of the facilities available in various Indian Universities, and the urgent measures which should be given effect to, in order to increase the outturn of research workers and also the probable member of additional men each University will be in a position to admit in the immediate future. From such data it was found that only the Universities of Calcutta, Bombay, Andhra, Benaras, Lucknow, Allahabad, Aligarh, Dacca and Punjab had fairly well-equipped post-graduate research departments while the Universities of Madras, Nagpur, Delhi, Patna, Annamalai and Agra were not so in this respect. (emphasis added).[57]

An observation made by the Committee (relevant in the Indian context even to day) was that a good proportion of the available scientific manpower in the country had not been made use of in a fruitful way in as much as owing to the then existing conditions of recruitment to services and other factors many qualified men had not suitable

57. Ibid (note prepared by S.S.Bhatnagar and appended to the Main Report)

opportunities of contributing all they could in the sphere of scientific and industrial activity.

II

A systematic attempt to develop technical education in Madras owed its origin to Sir Mountstuart Grant Duff who was Governor of the Presidency from 1881 to 1886.[58] Despite the fact that in Madras the College of Engineering, the Agricultural College and the School of Arts were already in existence, no attempt had been made to develop technical education systematically. In September 1884, Grigg, then Director of Public Instruction, was asked to submit proposals for the encouragement of scientific and technical education in the Presidency. Grigg's proposals were based on the experience of his "predecessors of a similar path at home •England§ and abroad' and the package contained a scheme of examinations, supplemented by a system of liberal grants-in-aid, making at the same time provision for a supply of well-instructed and professionally trained teachers; in addition steps were to be taken to develop the scientific and art institutions then existing in the Presidency so as to make them not only teach all or most of the sciences and arts of which need was then felt but also

58. For details of the scheme aimed at introducing a system of technical and industrial training in the Presidency, see
a) Scheme for the development of Scientific and Technical Education in Madras by H.B.Grigg, Director of Public Instruction, Madras.
- Papers Relating to Technical Education in India 1886 - 1904, (Calcutta 1906), p103-116.
b) Macdonnell's Note on Technical Education in India: Home Education A Proceedings, July 1886, No.27, National Archives of India. Reproduced in K.D.Bhargava (Ed.) op.cit, p57-67.
c) Note on Technical Education in Madras in Papers relating to the Industrial Conference held at Ootacamund in September 1905, (Madras 1908), p7-20.

serve both for the provision of a supply of science and art teachers and as models for private effort.

Grigg's scheme of development was divided into three main sections. The first place was given to the establishment of a system of higher examinations in technical subjects. Grigg believed that "to institute public examinations in any suitable branch of knowledge was to create a demand for instruction in them". He accordingly proposed to start examinations in some sixty branches of technical science, art and industry. The second part of his scheme included the provision of grants-in-aid to institutions providing facilities for industrial and technical education and the grant of scholarships to pupils undergoing such instruction, besides grants for machinery, plant, apparatus and chemicals. Thirdly, Grigg proposed the development of the College of Engineering, the School of Arts and the Agricultural College into institutes dealing with the several connected branches of technical works. The College of Engineering was to teach the various branches of engineering with subsidiary subjects, machine construction and the like. The School of Arts was to add to its curriculum decorative metal work, wood carving, cabinet making, furniture and architectural wood-work, pottery, glass manufacture and carpet-weaving. The Agricultural College was to teach, besides agriculture, agricultural chemistry, geology, physiography, forestry and surveying, plan drawing and veterinary surgery and medicine. Improved

provision for instruction in biology and chemistry was to be made in the chief firstgrade colleges while practical training in industries was to be provided in the workshops of the Madras Municipality and Madras Railway.

Griggs proposals were favourably received by government and high appreciation was expressed of the care with which the scheme had been drawn up.[59] The Government gave the first place to examinations and prompt action to start these tests were taken. The Committee appointed to fix the character of the syllabuses and the details of the examination submitted its report in November 1885 recommending examination in 63 subjects (revised to include 93 subjects in 1892). In December 1891 the name of the examination was changed to the 'Government Technical Examinations' and their objective was declared to be "the encouragement of scientific and technical instruction with special reference to manufactures and industries and generally to the necessities of the practical side of life."[60] However, the extension of the scope of work undertaken at the College of Engineering was negatived and no notice was taken of the suggested use of Railway and Municipal workshops for practical training.[61]

---

59. Resolution of the Government of Madras: Order dated June 3, 1885. No.377 (Educational) - <u>Papers Relating to Technical Education in India, 1886-1904</u>, (Calcutta 1906), p116-117.

60. <u>Note on Technical Education in Madras</u> in <u>Papers relating to the Industrial Conference held at Ootacamund in September 1905</u>, (Madras 1908)

61. It is pertinent in this context, to recall Krishna Kumar's observations on the examination culture, wherein, whatever could not be examined within the norms of the

Though some progress had been registered in technical education since Duff first drew attention to the subject in 1884 the Director of Public Instruction's Report for 1906-07 remarked that the general result was far from satisfactory. "Out of the large population of this Presidency" he wrote "less than three thousand children were receiving technical instruction in the various handicrafts and of these less than nine hundred were non-Brahmin Hindus, the class of the community to which the bulk of hereditary workers in wood and metal and textile fabrics belong. There is as yet little demand for technical education, and the little advance that has been made has practically left unaffected the great mass of the industrial population."[62] Among the causes attributed to the failure of Grigg's scheme of 1884-85 was the fact that only part of the scheme was carried out, while some of the most valuable suggestions contained in it had been given the go by. The attempt, moreover, it was pointed out, to create examinations without first providing qualified teachers and adequately equipped training institutions was to reverse the true order of progress. Most important of all, it was mentioned, was the

---

examination system was kept out of the curriculum, howsoever useful, relevant and interesting it might be "This is how thoretical, especially literary study acquired a dominant place in Indian schools and colleges. Literary study fitted nicely within the frame of textbook culture and written examination. Practical or vocational skills and subjects dependent on practical skills such as all the science subjects, were a misfit in the frame", "Origins of India's Textbook Culture", Nehru Memorial Museum and Library, op.cit., p17.

62...Ibid p.14

neglect to bring the scheme of technical education into relation with the industrial needs and conditions of the country. Even in providing scholarships for the encouragement of handicrafts sufficient care was not taken to see that they were reserved for members of the artisan classes - the scholarships too often fell to youths who had not the least intention of following the industry as a livelihood and who merely drew the scholarship while it lasted and then betook themselves to the role of clerk, peon, policemen or whatever the customary occupations of their class might be.[63]

Remarking on the general character of the industrial schools in the Presidency the Acting-Director of Public Instruction noted that the industrial schools in the Presidency were more in the nature of charity schools designed to feed, house and clothe a certain number of poor children than schools where young people were taught on scientific principles the theory and practice of industrial arts. Further their influence in improving the industries of the Presidency were practically nil; few of the managers of such schools ever placed such aim before them.[64]

Among the steps that had been taken for the encouragement of technical education in the Presidency may be mentioned the establishment of the Victoria Technical Institute (VTI) which was expected to take an important part

63...Ibid p15
64...Note by the Director of Public Instruction on Technical Education in Madras in Papers relating to Technical Education in India 1886-1904, (Calcuta 1906) p87.

in fostering technical education in the Presidency. In his memorandum recommending the setting up of the VTI, John Adam, member of the sub-committee on Technical Education emphasized that "humbler but very useful work must be performed before high class technical instruction can be appreciated by any but a small minority."[65] While Adam strongly underlined the fact that it was not the task of the Institute to impart general instructions, however, in the absence of pupils so instructed, it was essential that the Institute encouraged and assisted in the spread of general technical instruction before going on to more specialized instruction.

On the question of artisan education, Adam pointed out that every effort to impart technical instruction to such children had failed because they were totally devoid of general education and because their parents were unwilling to lose the value of their labour during the time spent in acquiring what appeared to be useless knowledge.[66] Apart from want of money, want of teachers, want of teachable material (which acted as obstacles to immediate or extensive action in directing the Institute towards special technical education), Adam stressed another obstacle, namely, want of knowledge (as to the extent and condition of various industries, how these could be improved by the application

---

65...'Memorandum on the Proposed Victoria Technical Institute' by John Adam
- <u>Papers relating to Technical Education in India</u> 1886-1904, (Calcutta 1906), p91-100
66...Ibid p94

of scientific principles and methods, and what sort and amount of instruction was best calculated to lead to much improvement).[67]

Commenting on the "peculiarly indefinite position" of the School of Arts, Adam noted that the School of Arts was probably intended to be the South Kensington of South India but the basic premises on which South Keningston was founded, were missing in the case of the School of Arts: namely, the availability of pupils with knowledge of drawing, a constant demand of qualified teachers and a large preferential demand for trained designers of pottery, carpets, prints, wall papers etc. in the great workshops throughout the country, and a public taste educated so far as to demand at least variety if not beauty in its surroundings.[68] The School of Arts consequently had to diverge from its original intention and concentrate on teaching elementary drawing to school children. " ... the influence of the School of Arts as an educative agent cannot be traced in any other scholastic institution or in any industry or workshop outside the building itself."[69]

In a despatch in November 1893, the Secretary of State questioned whether the Schools of Art in India served any useful purpose, and suggested that they might be converted into elementary technical schools and transferred to the control of municipalities or of private bodies. On receipt

---

67...Ibid p98
68...Ibid p99
69...Ibid p99

of this despatch the Government of India convened an Art Conference at Lahore, and later, invited the opinions of the local governments on the resolutions of that Conference. Duncan, Director of Public Instruction, Madras in his reply to the Government of India contended that the institution was the only one of its kind fitted to supply schools with teachers of drawing and of industries capable of ornamental treatment; that it had helped to train the young of the artisan and working classes to earn a better livelihood than they could otherwise have earned. He simply insisted on the retention of the School as a Government institution.[70] In a subsequent ruling the government also laid down that the School of Arts would continue to devote itself to what could be called artistic industries and would not be developed, or rather transmuted into an institute for teaching the application of science to mechanical manufacturing processes.[71]

In 1897 Chatterton took over as Superintendent of the School of Arts in Madras. Initially at his own expense, and later with the help of a small grant from the provincial government, Chatterton began experiments in the manufacture of aluminium vessels which subsequently became an integral part of the work of the School of Arts. Copper-smiths and bell-metal founders were employed; indigenous ways of working were initially adopted with changes being introduced

70...For a detailed summary see note by H.Tremenheere in Notes connected with Educational G.O.No.500, Press, dated October 11, 1900.
71...Ibid

very slowly and at convenient opportunities. From the outset there was a good demand from the military authorities and from Europeans for aluminimum vessels, and by, establishing agents and subsidiary workshops at various places the Indian demand was also stimulated.[72] By 1899 so much progress had been made that the government applied to the Secretary of State for permission to employ Chatterton for a term of three years in furthering the progress of technical and industrial education in the Presidency.

In a letter to the local governments, generally endorsing the conclusions of the Simla Conference on the subject of the Schools of Art, J.P.Hewett, Secretary to the Government of India, Home Dept. made a specific reference to the "successful establishment and extension of the aluminium industry in Madras" by Chatterton.[73] Hewett acknowledged that, but for the development of the aluminium industry, the articles formally produced by the workmen might have been supplanted in the Indian market by articles manufactured in other countries. But Hewett was quick to add that the government considered work of that nature to be outside the scope of the Education Department. " If any Local government feels that special efforts are required to organise or to

72...For details on the aluminium industry, see Padmini Swaminathan `State Intervention in Industrialization. A Case Study of the Madras Presidency', <u>Working Paper No.99</u>, Madras Institute of Development Studies, Madras, January 1991.

73...Letter (Nos 501-508, dated November 20, 1901) from J.P.Hewett, Secretary to the Government of India, Home Dept. to Local Govenrments
- <u>Papers relating to Technical Education in India, 1886-1904</u> (Calcutta, 1906) p249.

help any particular industry from the mercantile point of view, they should either invoke the assistance of private enterprise or should arrange for its development by means of special officers not connected with the Education Department."[74]

Reacting to the Government of India's suggestion that the further development of the manufacture of aluminium articles should be left to private enterprise, G.H.Stuart, Director of Public Instruction, Madras, pointed out that new industries could not be developed without incurring a good deal of preliminary expenditure, and though the profits could be large in the case of success, the whole cost of experiment would have to be borne by the experimenter in the case of failure. Private enterprise therefore could not be expected to undertake such work unless there was practical certainty of profit, and such certainty did not exist in regard to any new industry in the country. Government then was the only agency that could be depended on for nursing infant manufacturers, for bearing the cost of failures in unsuccessful experiments and for handing over the opportunity of profit to the community in general in successful cases. The advantge to government, it was emphasized, was not the money profit, but the diffusion of better methods and more varied industries among the industrial population of the country. Stuart also felt that, while the capture of the Indian markets by

74...Ibid, p250

substituting indigenous manufactures for imported articles was of the first importance, the promotion of an export trade was not to be neglected. According to him, the complete dependence of the Indian weaver upon the Indian market was the main reason why he (the weaver) was the first to suffer in times of famines when the market failed him.[75]

Chatterton, in his comments on Hewett's letter, pointed out that the industrial condition of the Madras Presidency was such that little good could be done in technical or industrial schools unless there were industries in the Presidency which would give employment to those who had passed through these institutions. The mercantile community of the Presidency were merely middlemen and it was not likely that they would risk capital to build up a manufacturing community, which, if successfully established, would be largely at the expense of the foreign trade of the country. Under the circumstances it was only to the government that labour could turn to for help and government could render them effective assistance only by becoming pioneers in new lines of business.[76]

While industrial education of some kind or the other was given in a large number of schools in the Presidency,

---

75...Letter from G.H.Stuart, Director of Public Instruction, Madras, to Secretary to Government, Educational Department, dated January 18, 1902.
- Educational G.O.No.114, Miscellaneous (Confidential), dated March 4, 1902.

76...Note by Chatterton on letter No.501 (by J.P.Hewett, dated November 20, 1901, from the Home Department of the Government of India)
- Educational G.O.No.114, Miscellaneous (Confidential), dated March 4, 1902.

the majority of them offered only very elementary instruction and were of no industrial importance. In a very rudimentary state there were several industries practised in various parts of the Presidency which could be investigated and possibly developed. From his experience in the aluminium industry, Chatterton opined that there was need to set up industrial schools with a view to producing goods to compete with imports all over India since demand from a single Presidency was in many cases insufficient to build up a business. Industrial schools, therefore, were not to be regarded as purely Provincial institutions and it was to be brought to the notice of the Committee of experts that where new industrial developments were to be attempted through the agency of schools under a Technological department the whole work throughout India was to be coordinated and organized so that no institution trespassed on the field taken up by another.

An examination of the facts concerning the chief local industries in each district, the list of schools which could be classified as industrial or technical schools, the subjects taught in these schools and the numbers of the different classes of the community attending them, revealed that the total number from the community classed under 'non-Brahmin caste Hindus' (whose hereditary occupation was an industry) reported to be studying in industrial and/or technical schools was 983. If from this number was taken

---

77...Ibid

away those studying commercial subjects like telegraphy, music and drawing, those in carpentry classes in schools (which were manual occupation classes) and also those in the Reformatory school the analysis of the remainder made it quite clear that there were not 100 pupils in the whole Presidency who were then receiving instruction in the methods and processes of their hereditary caste occupations or in the principles underlying the same. "So that I think we may say that the existing schools while doing useful work in other ways, for instance, teaching Native Christians and others a trade and affording instruction to all classes of the community in certain technical subjects are doing nothing towards what I call the real problem of industrial education. I am not condemning the existing schools, they fulfil to a greater or less extent a useful purpose. The particular field which the Government of India have in view is however at present almost a blank." (emphasis added) Bourne, who made the above observations, was also skeptical about teaching principles of industrial processes to children when the industries themselves were on their last legs, and there was no sign of capital forthcoming to put into practice the new processes that the children may have learnt. Instruction, under such circumstances would be tantamount to "offering them a stone when they ask for bread".[78]

78.. Letter from A.G.Bourne, Director of Public Instruction, Madras, to the Secretary to Government, Educational Department, dated June 26, 1904.

Chatterton, in a lengthy comment on the recommendations of the Committee on Industrial Education, observed that nearly all the authorities who had made a careful study of the question and specially those who had been practically engaged in fostering industrial education were of the opinion that, but little progress would be made unless government were prepared to embark upon a series of industrial experiments which to be successful needed to be worked on a comparatively large scale.[79] The Government of India fully accepted the fact that experiments were necessary but evidently wanted to avoid carrying on manufacturing operations on what could be termed a commercial scale. These objections were founded upon a desire to interfere with private enterprise as little as possible and upon a realization of the difficulty that government would inevitably experience in effectively controlling any commercial undertaking which was carried on in their name. While Chatterton fully acknowledged the force of the objections to any scheme aimed at exploiting Indian industries with government funds and under government control, yet, he felt that, because in the south of India industrial enterprise was almost non-existent, it was therefore useless to provide for technical and industrial education, unless at the same time efforts were made in some way or the other to improve the status of existing

---

79...Letter from A.Chatterton, Officer in Charge, School of Arts, Madras to the Director of Public Instruction, Madras, dated November 13, 1903.
- Educational G.O.Nos.313-314, Press, dated May 12, 1905.

industries and provide for the introduction of new ones. Whilst, therefore, he considered that it would be necessary in the immediate future for government to undertake the working of industrial experiments on a commercial scale, he emphasized that, that was to be regarded as exceptional. He was strongly of the opinion that the College of Engineering in Madras was to be developed and made the centre of all educational effort in the Presidency which did not come under the term general education. Private enterprise in the Presidency being very weak, it was Chatterton's suggestion that for the successful introduction of new industries or important improvements in existing industries, it would be necessary for government to set up temporary special industrial schools analogous to the erstwhile aluminium department of the School of Arts. He was also critical of the College of Agriculture and lamented that the latter had not materially influenced agriculture in the Presidency.[80]

Earlier in a note drawn up for the Committee on Industrial Education, Chatterton drew attention to the fact that, unlike, Bombay, Cawnpore and Calcutta, there were no important industries in the Presidency; there were a few cotton mills, weaving sheds, cotton presses and ginning factories, several large railway workshops, two or three small iron works, one Portland cement works, one or two oil presses and a number of important tanneries all of which were carried on by joint stock companies with European and

80...Ibid

indigenous capital. The other industries were practically unorganised and in the hands of artisans. The fact that only 11 per cent of the population lived in towns made the task of getting at the industrial classes by means of industrial schools seen almost outside the scope of practicability.[81]

On the question of the reorganization of the School of Arts, while Bourne favoured the appointment of a European to the post of Superintendent of the School of Arts,[82] Chatterton was of the opinion that in a school for the promotion of Indian arts and art industries the instructors "shall all be natives of the country". Further and more important, he added: "It cannot be said that in the past Indian schools of art under the superintendence of English artists have been a conspicuous success. Indian art is the product of the country and the people and it is better that it should remain so and that Indian schools of art should work out their own destiny rather than that they should be forcibly converted into schools of 'art and craft' type which have been evolved of late years in Europe. Under these circumstances I would propose that the Superintendent of the School of Arts be selected in this country."[83]

---

81. Quoted by Ampthill in his note: For details see Notes connected with Educational G.O.Nos.313-314, Press, dated May 12, 1905.
82. Letter from A.G.Bourne, Director of Public Instruction, Madras to the Secretary to Government, Educational Department, dated March 2, 1905.
- Educational G.O.No.524, Press, dated August 3, 1905.
83. Letter from A.Chatterton, Officer in Charge, School of Arts,Madras, to the Director of Public Instruction, dated January 16, 1904.

It was also realized that the value of the industrial education in the country was largely discounted by the fact that a very considerable proportion of the recipients of such education never made any use of it afterwards. In the School of Arts, the great ambition of the apprentices was to become drawing masters and failing that engravers. Few of them followed the trade they had learnt, if there was any possibility of making their lives otherwise. Chatterton admitted that it seemed impracticable to devise any system of rules which would counteract this tendency, but, he felt, that if the course of training was such that high class and skilled workmen were turned out, these would be able to make more money as craftsmen than as drawing masters provided there were ample opportunities for their employment. The remedy therefore lay in the commercial development of the Indian art industries so that there was regular and steady employment of skilled men.[84]

In connection with a question asked at the meeting of the Legislative Council held in November 1906 enquiring whether the Government of India had passed orders on the proposals submitted to them in regard to the scheme of technical and industrial education to be introduced into the Presidency, Forbes, an official in the education department observed:

"The fact is the whole subject has got into a mess owing to the confusing of technical education with technical

- Educational G.O.No.524, Press, dated August 3, 1905.
84...Ibid

instruction or apprenticeship. We (the education department) have no separate definite scheme of technical education because that subject presupposes knowledge of mathematics or chemistry or other scientific knowlege which is at the bottom of the particular industry. At the same time we have been supporting some so-called technical schools which are really not affording technical education in the proper sense."[85]

In order to promote industrial development in the Presidency it was proposed in 1905 to sever technical education completely from general education, to create a separate department to deal practically with the promotion of industries by experiment and advice as well as with the imparting of theoretical instruction in technical schools and colleges and to place the department under an officer styled the `Director of Industrial and Technical Inquiries'. The Government of India in their despatch in 1906, in recommending to the Secretary of State the creation of an appointment of `Director of Industrial and Technical Inquiries' remarked that it was desirable to pursue the investigations on which Chatterton was engaged and added:- "We have entire confidence in Chatterton's qualifications to discharge such a task. At the same time it appears to us that as the appointment is being created mainly on grounds of a personal nature it should at present be sanctioned provisionally for the time of Mr.Chatterton's incumbency,

---

85...See p24 of Notes to Revenue G.O.No.2894, Press, dated October 17, 1908.

the question of its permanence being left for future consideration when he vacates it. It will then be possible to determine in the light of further experience whether such an appointment is permanently required or not."[86]

In passing orders on these proposals, the Secretary of State stated in his despatch in August 1906, that he was unable to anticipate with much confidence the attainment of satisfactory results from the direction of State effort towards the creation of industries but he was, however, willing that the experiment should be tried in view of the special circumstances of the Presidency and of the talents and enthusiasm which rendered Chatterton well fitted for the proposed appointment. He sanctioned the appointment provisionally in the first instance for a period of five years.[87]

On receipt of the Secretary of State's sanction, Chatterton was appointed Director of Industrial and Technial Inquiries. He was directed to follow the lines on which he had been working since first he was placed on special duty in 1900 for the purpose of subjecting to a detailed examination each of the more important industries of the Presidency in turn and indicating the lines on which improvement might best be effected, devoting special

86...For a brief outline of the history of the appointment of a Director of Industrial and Technical Inquiries and the need for a definite Department of Industries see letter from L.M.Wynch, •Acting Secretary to the government of Madras, Revenue Department§ to the Secretary to the Government of India, Home Department (Education), dated March 3, 1909. - Revenue G.O.No.3446, Press, October 27, 1910.
87...Ibid

attention to the chrome leather industry, the improvement of the handloom industry and the development of irrigation by pumps driven by oil-engines. Chatterton was, in addition to his other functions, entrusted, subject to the control of the Director of Public Instruction, with the inspection of eighteen technical schools, in which instruction was given in engineering subjects, in wood and metal work and in the preparation of textile fabrics.

The satisfactory results achieved by Chatterton in these directions convinced the Governor-in-council in Madras of the desirability of enlarging the scope of his work. In order to determine the lines on which action could be taken, a conference of persons either concerned or interested in the conduct of the chief industries of the Presidency was summoned and met in September 1908. The deliberations of the conference took shape in the form of 68 resolutions.[88] On the general and cardinal question whether state intervention was desirable or necessary in fostering industrial development in a country in which private industrial effort had hitherto been either spasmodic or practically non-existent, the opinion of 35 out of the 38 gentlemen who composed the conference laid down that subject to the restrictions therein specified, the government could undertake as a pioneer, the introduction of new industries

88...For details, covering the papers printed for the use of the members of the Conference, the proceedings of the Conference and the Resolutions passed, see Papers Relating to the Industrial Conference held at Ootacamund in September 1908, (Madras 1908).

or industrial processes for the purpose of training students or apprentices or for demonstrating that such industries could be commercially viable/successful. The Governor-in-Council in the Madras Presidency recognised the impossibility of taking immediate action regarding all the subjects dealt with in the recommendations but considered that there were some directions in which immediate action was possible and desirable. The most important of these were the transfer of industrial institutions from the control of the Educational Department to that of the Director of Industries, the formation of a bureau of industrial information, and an industrial museum, the establishment of weaving institutions under the superintendence of experts and the establishment of a leather trade school under the supervision of a leather expert among others.

The Governor-in-Council accepted the principle that there had to be a separate department of industries and accordingly appointed Chatterton as the Director of Industries. He also submitted to the Government of India, that for the satisfactory development of industries in the directions indicated by the Conference it was essential to make the post of the Director of Industries permanent.[89] The Secretary of State however thought otherwise and vetoed the Madras Government's move to establish a separate department of industries with Chatterton as director. The

89...L.M.Wynch's letter dated March 3, 1909.
- Revenue G.O.No.3446, Press, October 27, 1910

policy which Lord Morley, the Secretary of State, was prepared to sanction was one where state funds could be expended upon familiarizing the people with such improvements in the methods of production as modern science and the practice of European countries could suggest; further than this it was to be left to the private enterprise to demonstrate that these improvements could be adopted with commercial advantage.[90]

"Within the limits here indicated it appears to me that the objects which the Industrial Conference had in view can all be accomplished by means of technical and industrial schools; it is in such schools that a knowledge of new industries and new processes can best be imparted, that the use of new implements can best be taught, and the technical skill of the artizans most readily improved...To convert the leather or weaving school into a government factory in order to demonstrate that articles can be manufactured and sold to the public at a profit, goes, in my view beyond what is desirable and beyond what is found necessary in other provinces."[91]

On the abolition of the department of industries by the Secretary of State in October 1910, Chatterton was appointed to the newly created post of Superintendent of Industrial Education in the Educational Department. This appointment he held until late 1911, when it was found

---

90...Despatch from the Secretary of State for India to the Governor-General of India in Council dated July 29, 1910. - Revenue G.O.No.3446, Press, October 27, 1910.
91...Ibid

impracticable to carry on pumping and boring operations under the arrangement in force and Chatterton was accordingly placed on special duty in the Revenue department in charge of these operations, his place as Superintendent of Industrial Education being taken by Tressler.[92]

Chatterton in a note submitted to the Revenue Secretary to Government came down heavily on the proposal to divide the work carried on by the department of industries between two officers, one under Education and the other under Revenue which move according to Chatterton, would seriously curtail the amount of useful work done by either officer. While the Secretary of State had sanctioned the appointment of experts in tanning, weaving and dyeing these men however had to work in the Education Department thereby dissociating them to a large extent from the work going on in the country. Besides teaching, an important part of the duties of the experts was to carry out experimental investigation with a view to improve industrial processes. But under the restrictions laid down by the Secretary of State it was difficult to surmise how the experts would be able to discover what was wanted in the country and further how they would be able to demonstrate in a convincing way any improvements they would make. As far as the officer working in the Revenue department was concerned it was proposed that

92...Details contained in the letter from K.T.B.Tressler, Acg.Superintendent of Industrial Education to the Director of Public Instruction dated May 29, 1912 submitting the report on the progress of industrial education in the Madras Presidency for 1911-12.
- Educational G.O.No.765, Press, August 22, 1912.

he was to deal with industrial investigations and head the Bureau of information. As head of the Bureau he would be expected to deal with inquiries regarding weaving, tanning and dyeing, but the Government experts specially appointed would not be available to assist him as they would be working independently in the Education Department. This would, according to Chatterton, unquestionably very seriously reduce the efficiency of his work, as chief adviser to local industrial enterprise.[93]

Were the proposals under consideration carried out, there would have been in the Madras Presidency technical and industrial education carried on, on three distinct lines:-

(1) In the College of Engineering and the School of Arts where all branches of engineering work and everything related to art industries were under the Director of Public Instruction,

(2) The technical and industrial education yet to be developed and for which already three experts had been sanctioned who were to be under the Director of Public Instruction working through the Superintendent of Industrial Education,

(3) The preliminary and final stages of practical, industrial and educational work which would be under the Director of Industries in the Revenue department.

93...See enclosure entitled 'Copy of note submitted to the Revenue Secretary to Government' by A.Chatterton to the Director of Public Instruction, Madras, dated March 8, 1911. - Educational G.O.No.274, Press, May 12, 1911.

This tripartite division of work, according to Chatterton could not possibly conduce to efficiency.[94] But the practical action that Chatterton wanted the government to adopt contained within it the seeds for perpetuating and accentuating the class-cum-caste-wise division of the population. Chatterton wanted industrial education to be provided at two levels: (i) operatives or their allies who would be mainly drawn from the existing artizan classes; and (ii) masters and foremen who would control industrial undertaking and who would probably be mainly drawn from the upper ranks of the educated Indian population. "For the indigenous industries [therefore] it seems inevitable that we must have recourse to industrial schools, but I would suggest that instruction in each industry should be confined to the sons and relatives of those actually engaged in the industry at the present time: that is to say, we should carry on the industrial schools on a caste basis. The indigenous industries have suffered very severely from foreign competition and it will not help the people still dependent on these industries for a livelihood to have added to their difficulties the competition of locally trained people belonging to the non-artizan castes."[95] The Madras government had accepted the principle that industries had to exist for any useful results to accrue from provision for technical education in such industries. This meant that the

94...Ibid
95...See enclosure (ii) entitled 'Industrial education'. Ibid.

pioneering of industries had to precede technical education but the orders of the Secretary of State precluded the government from taking up such work. Chatterton strongly urged the Government to approach the Secretary of State for a reconsideration of the latter's orders prohibiting governments from carrying commercial work in pioneering new industries.

While Chatterton was emphatic that the local government had to pioneer and demonstrate the commercial viability of industries, either existing or new in order to make technical education really meaningful, his successor, Tressler, was more concerned in getting government to spell out its objectives clearly as far as industrial education was concerned.[96] According to Tressler the most characteristic feature of the educational methods then followed in industrial schools was their absolute lack of common or definite objective. Each school was a law unto itself, over an entirely arbitrary range of subjects each school imparted instruction in a different manner with a different object in view. Further, the system according to which the extent and nature of State aid to be given to industrial schools was determined, was equally vague. Apart from minor considerations the main condition for recognition was that the teaching staff had to possess certain

---

96...Letter from A.G.Bourne, Director of Public Instruction, Madras, submitting 'Notes on Industrial Schools' by Tressler, to the Secretary to Government, Educational Department, dated March 26, 1912.
- Educational G.O.No.833, Press, July 16, 1914.

prescribed qualifications. If this condition was fulfilled a school could receive financial assistance to the extent of half the net cost of maintenance. The nature of teaching then provided in industrial schools however made it clear that the qualifications then called for, excellent though they were from an academic point of view, constituted no test of a teacher's practical acquaintance with industrial requirements and was therefore in most cases valueless as a criterion of his ability to teach an industrial subject.

What therefore the system represented was manual training, and hence Tressler felt that if the object was merely to multiply the number of workmen irrespective of quality, the then existing system was satisfactory enough though it had to be clearly recognised that it did not represent industrial education. On the other hand, any objective of making education truly industrial had to be done only by workshop training conducted under conditions of efficient manufacture. "If we accept the first alternative then manufacture does not come within our sphere at all, and should be entirely ignored. Most of the industrial schools provide a very fair course of manual training which, however, they almost inevitably associate with manufacture of a more or less inefficient character."[97]

The feeling that industrial and technical education should come under the purview of the department of industries was very strong in the Madras Presidency and was

97...Ibid

echoed at various forms. In the notes prepared by the Director of industries on the subject of the "Control of Industrial and Technical Education" (which was to be placed before the Industrial Conference that was subsequently held in March 1920), the following reasons were listed out as justification for the separation of industrial and technical education from the purview of the Director of Public Instruction.[98] It was pointed out that the department of industries was in direct touch with the employers of labour and was more likely to be able to translate the views of such employers into practice. Moreover, the department of industries would contain experts whose opinions would always be available quickly and departmentally, when new schemes of industrial and technical education were being concerned. Another reason for keeping industrial education under the department of industries was that it would be possible to attach model workshops, mills and demonstration factories as and when they were established in the future by the department.

In a demi-official, Davies the Director of Industries categorically objected to the appointment of the Director of Public Instruction for participation in the Industrial Conference, since he not only considered that the education department had failed in a great many respects with regard to general education but considered that the retardation of the development of technical education throughout the

98...Revenue (Special) G.O.No.640, (Press), March 29, 1920.

Presidency had been due to the ignorance displayed and the lack of policy exhibited by the Director of Public Instruction in dealing with the subject. "Technical education, when in the hands of the Educational Department has had no definite beginning, no clear end and no sensible line of work. Therefore the co-optation of the Director or the officers of his department to a Conference which is going to deal with technical and industrial education is unnecessary and inadvisable."[99]

As the Administration Report of the department of industries for the year 1920-21, stated, the most important event of the year in connection with the policy to be adopted to further industrial development in India was the receipt of the Secretary of State's despatch signifiying his general assent to several of the proposals made by the IIC and supported by the Government of India.[100] The Secretary of State's despatch marked a revolutionary change in policy, for he definitely accepted the two fundamental principles underlying the recommendations of the Commission; first, that in future, government should and would play an active part in the industrial development of the country, and secondly, that, government would not undertake this work unless provided with adequate administrative equipment and forearmed with reliable scientific and technical advice. He approved in principle the proposal that an Imperial and

99...See p9 of Notes to Revenue (Special) G.O.No.640 (Press), March 29, 1920.
100...Revenue (Special) G.O.No.4, January 3, 1921.

Provincial Department of Industries would be set up on the general lines laid down by the Commission, and sanctioned the proposal of the government of India that an interim authority, a Board of Industries and Munitions would be set up which would close the war commitments of the Indian Munitions Board, take over from the Commerce and Industries Department certain items of work, undertake the initial work or organization and in particular frame detailed proposals for the new permanent department. The Secretary of State thus reversed the restrictive policy laid down by Lord Morley in 1910, which though modified by Lord Crewe in 1912 and temporarily held in abeyance while the Commission was conducting its inquiry, was still in force, and recognised that, if the active participation of government in industrial development of the country was to be accepted as one of its legitimate functions, a new policy was required.[101] For the Madras government the despatch of the Secretary of State was an endorsement of the policy repeatedly advocated by the former, namely, of the express need in India of active state participation in industrial development.

Subsequent readings of the administration reports of the department of industries bring out clearly the limited impact that the department had on the industrialization of the Province despite organizational changes in keeping with the recommendations of the IIC as endorsed by the Government

101...Ibid

of India and accepted by the Secretary of State. The constitution of the Board of Industries, the commercial enquiries taken up by the Government as also investigations of its own into the possibility of starting new industries, the enactment of the State Aid to Industries Act, the revival of the annual Industries Conference etc. -- all this and much more really did not add up to much. Given the politics of the time, the Government was not interested in a consistent and coordinated programme of development involving intense regulation of the economic life of the country, including the activities of the private sector. Being forced by circumstances to act, their method of approach was to select piecemeal certain lines of development and to concentrate on them individually without considering the economy as a whole. This attitude towards economic development and this method of approach failed to achieve any substantial improvment with large sections of the population not being touched at all.

Prior to 1926, the policy of the local government in regard to industrial development included the starting of pioneer factories with a view to ascertaining the commercial possibilities of manufacturing articles not produced in the Presidency. In view of the so-called facilities afforded by the State Aid to Industries Act when it became law in 1923, the policy of government in regard to the pioneering of industries underwent some modification in 1926, and it was laid down that the experimental work of the department of

industries should not ordinarily proceed beyond the stage of laboratory tests and that pioneer manufacture on a commercial scale should be left mainly if not entirely to private enterprise. It was also considered advisable to concentrate the attention of the department on the organization and development of small industries preferably on cooperative lines, particular stress being laid on the importance of village or rural industries with special reference to their suitability as subsidiary occupations during the slack season for the agriculturists. The policy was followed in subsequent years with little or no change.[102]

The problem of the administration of technical education in the Presidency turned a full circle when in 1948, in the Report of the Committee (set up by the Standing Advisory Board for Technical Education) a proposal to create a Technical Educational Board with a Director of Technical Education was explicitly made. The Report divided the technical institutions then existing in the Province into four types, namely,

(a) degree level affiliated to the University - Engineering colleges;

(b) Polytechnics - of a lower grade than the Engineering Colleges;

102...For details see 'Review of State action in respect of industries' - Memorandum submitted to the Government of India.
- Development Department G.O.Nos.360-61, Miscellaneous, dated March 3, 1935.

(c) Technical High Schools;

(d) Industrial schools.

While (a) and (c) were under the department of Education, (b) and (d) were with the Industries Department. The Board felt that as these formed different grades of technical education, they could be placed under the administrative control of the Director of Technical Education with a Technical Education Board to assist him in his duties.[103]

103...See Notes of Speech delivered by T.S.Avinashilingam, Minister for Education, at the meeting of the Standing Advisory Board for Technical Education held on December 1st, 1948.
- Education G.O.No.2276, Miscellaneous, dated August 12, 1950.

III

To a large extent the question of inadequacy, inefficiency and vagueness that, characterized the whole course of technical education in the province, and, the recurring and inconclusive debates that went on from time to time around the theme of how to make technical education `more practical' and/or how much of "practical education" was to be introduced into "technical" instruction, had to do at one level, with the larger and more fundamental question of how deep and how far the State was to involve itself in such questions. At another level the colonial impact has been deep and structural, revealing itself in many ways: in the manner in which long years of foreign rule has shaken the confidence of the people in the viability of their own culture and institutions; in the continuing impact of colonialism wherein the essential structure of the educational system, inherited from colonial days has been retained intact along with curricular orientation, the language of instruction and of intellectual discourse, and books and journals.

The indecisiveness that marked the whole approach to the problem of technical education can be gathered from the periodic doubts that were raised as to what constituted technical education - an issue that was never really satisfactorily dealt with at any level. We do not propose to go into this question at any length but suffice it to highlight some of the discussions that took place around

this theme and the manner in which each Presidency interpreted the same to suit conditions within the Presidency.[104] The aim of the Bombay Government's technical education programme was to supply practical instruction with a view to raising the standard of existing industries and for preparing the way for other useful developments. Cotton mills and railway engineering being the chief industries in Bombay then, it was said that what was required was an institution located in the districts where the mills were, and near the railway workshops, and that, in this institution instruction was to be given in such sciences as were necessary for the practical requirements of the manager and foremen on the one hand and of the skilled artisans and mechanics on the other. As far as the North-west Provinces and Oudh was concerned, Colvin, the Lt.Governor, pointed out that on the one hand there was a variety of arts and handicrafts in existence from time immemorial and the efforts of the schools of art to assist in the improvement of these industries had not been very successful. On the other hand the extension and growth of British rule had brought forth certain industries not of the hereditary caste-based occupation variety. Colvin emphasized that "it is therefore peculiarly the interest of the English government to provide for the instruction of those who

---

104. For details see A.Colvin's 'Minute on Technical Education', Home Education A Proceedings, December 1892, No.50. in Papers Relating to Technical Education in India, 1886-1904. (Calcutta 1906) pp123-31.
- Also reproduced in K.D.Bhargava (Ed):op.cit., pp89-107.

desire to be engaged in these industries, and to create every facility for increasing the number of those who may so desire".[105]

In a memorandum recommending the setting up of the Victoria Technical Institute in Madras, John Adam, one of the Committee members divided technical instruction into two distinct but broad branches, namely general and special. By general technical instruction he meant the training of the whole body of school going children in one or more of those branches that were fundamental or necessarily preliminary to all instructions. The application of these branches to particular trades or industries was termed special technical instruction. Thus all decorative arts, painting, modelling, engraving, jewellers work, embrodiery, etc. formed special applications of design and no pupil who had not attained a certain proficiency in free hand drawing could be admitted into a class for any one of the above subjects. In the same way an elementary knowledge of geometry and mechanics was essential to the study of mechanical engineering while some acquaintance with chemistry and botany was a necessary preliminary to a study of agriculture, forestry, horticulture and allied branches.[106]

The Simla Conference defined technical education as -

105...Ibid

106..'Memorandum on the Proposed Victoria Technical Institute' by John Adam - <u>Papers relating to Technical Education in India, 1886-1904, op.cit, p91-100.</u>

(a) the study of the scientific methods and principles, underlying the practice of any handicraft, industry or profession;

(b) the application of those methods and principles to the practice of the handicraft, industry or profession in question.

The first referred to the primary or technological aspect of the subject; the second to its subsequent and practical application.[107]

The most scathing comments, attacking the lack of conceptual clarification on the subject of technical education, came from the editor of the Indian Textile Journal, John Wallace, whose piece is worth quoting at some length:-[108]

"One of the rarest things in India is to hear a definition of technical work. It is generally assumed to consist of a mixture in no fixed proportion of science and art; the science being mathematical, mechanical and chemical, and the technique - the art of some kind of work in wood and metals....

The confusion of the terms technical and scientific are exemplified in two institutions in the Bombay Presidency. In the College of Science, Poona, various physical sciences

---

107...Resolutions of the Simla Conference (1901) on technical education' in <u>Papers relating to Technical Education in India, 1886-1904</u>, op.cit. pp251-254.
108...`Technical Education for the Workman' by John Wallace, Editor, "Indian Textile Journal".
- Reproduced in <u>Papers relating to the Industrial Conference</u> held at Ootacamund in September 1908, op.cit., pp136-141.

are taught, and illustrated by means of work in wood and metals for the training of enginners on roads bridges and canals. In the Victoria Jubilee Technical Institute, Bombay, various physical scinces are taught and illustrated by means of work in wood and metals for the training of students in mechanical or electrical engineering and textile work. It is not easy to guess on what basis the titles of the two institutions were chosen, but they illustrate the popular acceptation of the terms science and technique.

The cause of the present state of technical education in India is traceable to the constitution of the Educational Department which is controlled by University men, whose ideas of education are so built upon reading and writing as a foundation that they have overlooked the true relation of technique to science in a country whose industrial training is still in a very backward condition. In every other country, which has reached any industrial eminence, the knowledge of handicraft preceded by many generations, that of reading and writing.

India has yet to recover from an educational impulse in the wrong direction. Reading and writing, which have been of incalculable value of certain classes, are not of use at all, and they become positively pernicious when they entice young men away from a sure living by handicraft to the overcrowded ranks of clerical labour."

For a full assessment of the colonial legacy even at the provincial level, it would be essential among others, to

examine critically and in depth the components that made up what passed for technical and industrial education. In the Madras Presidency these comprised the following:-[109]

I (a) Technical Scholarships Abroad: Number of scholarships tenable at a time - four

(b) Government Institutions: consisting of

The Government School of Technology

The Government Industrial and Trades School

Aided Industrial Schools

The Government Leather Trades Institute

(c) Scholarships to students tenable at:-

(i) The Indian Institute of Science, Bangalore

(ii) The Victoria Jubilee Technical Institute, Bombay

(iii) Benaras Hindu University

(iv) The Indian School of Mines, Dhanbad

(v) Jamshedpur Technical Institute

(vi) Scholarships for Sugar manufacturing technology

(vii) Aided Industrial Scholls

d Institutes (cottage industries) :comprising

(i) The Government Textile Institute

(ii) The School of Arts and Crafts

II The Engineering College, Madras

109...`Review of state action' in respect of industries - Memorandum submitted to the Government of India. - Development Department G.O.No.360-61, Miscellaneous, dated March 7, 1935.

The scope of our study has not been expanded to include an examination of the above. However, a paper tracing the development of the Engineering College at Madras has made some important observations, relevant to the argument of our paper.[110] It is pointed out that only in 1911 the need for an institution capable of generating knowledge for local requirements was expressed and plans made to convert the Madras Engineering College" into a high class technological institute capable of dealing not only with the immediate but also the prospective needs of the Presidency." In 1922 again came the recommendation that "the College of Engineering at Guindy should be expanded in due course and developed into a technological institute" Despite all these exhortations, the paper points out, the college failed to become an advanced centre of research until after India achieved its independence.[111]

Again the comparison between the Madras Engineering College and the Engineering College established at Tokyo, Japan is revealing. "The establishment of this college °Tokyo Engineering College§ has been claimed as an important milestone in Japanese development because it was this college that acted as a catalytic agent for the emergence of Japanese technical eminence in the future. Within 30 years of the establishment of this College, nine other major technical institutions teaching civil engineering, ship

110...Ambirajan, S. "The Content of Science and Technology Education in South India during the Colonial Period" (mimeo, Madras, undated).
111...Ibid

building, electrical engineering, mining and metallurgy, and with a total strength of 1200 students, were brought into existence. By 1903 - thirty years after its establishment - the Tokyo Engineering College had a staff strength of 24 professors, 24 assistant professors and 22 lecturers. By contrast, in 19[illegible] - fifty years after the Madras Engineering College was established - it had no more than four professors and 12 instructors."[112]

While there never was any sustained/single-minded expansion of technical education in India, even the feeble efforts at spreading the same could not have had any positive effect in broadening the base of "steam intellect"[113] given that official policy at the same time was overtly and covertly antagonistic to any large scale industrialization taking place in India. When exceptional individuals like Chatterton tried to create a demand for technical education by involving the State in entrepreneurial activity, a lot of hairsplitting took place over whether that was the right method of instruction and over where state promotion ended and commercial interest took over. Chatterton's efforts were frowned upon by the higher authorities. J.P.Hewett, Secretary to the government of India made it clear in no uncertain terms that "the success achieved by Mr.Chatterton has been due to his

---

112...Ibid

113...Ambirajan, S. "Steam Intellect and the Raj: Technical Education in South India in the Nineteenth Century" in Ian Inkster (Ed): <u>The Steam Intellect Societies-Essays on Culture, Education and Industry Circa 1820-1914</u> (Nottingham 1985)

peculiar qualifications for the work which he has undertaken. Such qualifications are not ordinarily to be expected or desired in an educational officer, and the Government of India wish it to be distinctly understood that commercial enterprises, such as this must not be undertaken as a part of the scheme of Technical Education in India."[114]

A "carefully planned and meticulously executed policy" of defrauding and exploiting India cannot be drawn from studies with limited scope such as ours. However, from a concatenation of events, from statements of officials who mattered and from an examination of the legacy that has been left behind, it is possible to infer and establish with some amount of certainty the fact that in colonial education there occurred simultaneously an obliteration of the roots of the colonized and the denial of the wherewithal to change except on limited terms. Further, the tension between the upward mobility promised by modern studies and the limited opportunities open to the colonized for advancement exposed

---

114...Letter from J.P.Hewett, Secretary to the Government of India, addressed to the Local Governments regarding encouragement of technical education, dated November 20, 1901.
- Papers relating to Technical Education in India, (1886-1904), op.cit, p253-54.
It is interesting to note the different position taken by J.P.Hewett as Lt.Governor of the North-West Provinces and Oudh. In his inaugural address to the Industrial Conference held at Nainital in August 1907 he observed: "°But§ it does seem to be an axiom that there is a very close connection between education and the progress of industries and trade. Undoubtedly this truth has not been sufficiently recognized in India, and to my mind its backwardness in industries and trade is largely due to the failure to recognize the importance of organizing on a proper basis its system of education", (emphasis added)
- Reproduced in K.D.Bhargava (Ed): op cit, p274.

the fundamental paradox of British imperialism: economic exploitation required the sanction of higher motives, but once colonial intervention took on a moral justification[115] - that is, the improvement of a backward people - the pressure to sustain expectations of the people and match the educational opportunities with job opportunities created new internal stresses. At the same time official statements like Wood's despatch clearly articulated the material interests of capitalist society while endorsing an educational system that reproduced division of labour directly and caste structure and social inequalities indirectly.[116]

---

115. For a well documented elaboration of the colonial discourse on education (to which both English and Indian intellectuals contributed) and which implied a morally superior teacher and a society whose character was in need of reform, see Krishna Kumar :"Colonial Citizen as an Educational Ideal", Occasional Papers on History and Society, (Second series), No.XIII, Nehru Memorial Museum and Library, New Delhi, November 1988.

116...For an excellent overview of the educational manifestations of colonialism see

(a) P.G.Altbach and Gail P.Kelly (Eds.): Education and Colonialism, Longman Inc, New York, 1978, specially, the Introduction.

(b) Gauri Viswanathan Masks of Conquest: Literary study and British Rule in India, Faber and Faber, London 1990.